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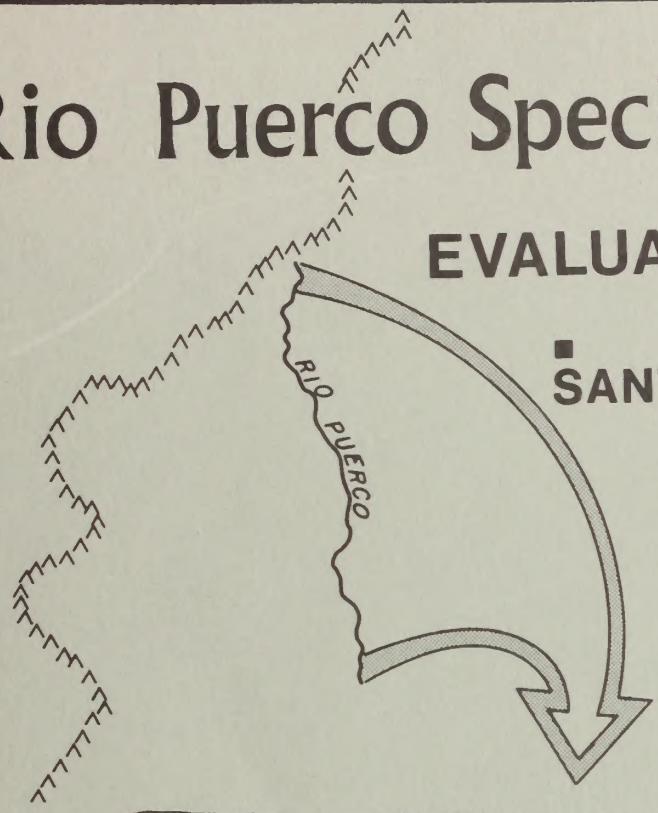
Rio Puerco Special Project

EVALUATION REPORT

SANTA FE, NEW MEXICO
1972



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June 30, 1972

Memorandum

To: State Director, New Mexico

From: Rio Puerco Special Project Evaluation Team

Subject: Evaluation of the Rio Puerco Special Project

The attached report responds to your instructions that an evaluation be made of the Rio Puerco Special Project. Your particular attention is directed to Section II Findings and Recommendations.

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Chief, Planning Coordination Staff, NMSO

John Davis
Resource Coordination Staff, WO

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TABLE OF CONTENTS

		Page
I.	Summary of Evaluation	1
II.	Findings and Recommendations.	2
	A. Major	
	B. Minor	
III.	Nature of the Evaluation and Assumptions.	12
IV.	Origin and History of the Project and Background. . . .	14
V.	Original Project Objectives	16
VI.	Accomplishments to Date	17
VII.	Evaluation of Benefits and Effectiveness.	18
	A. Vegetation and Soils	
	B. Wildlife and Recreation	
	C. Environment	
	D. Flood, Sediment and Water Quality	
	E. Social and Economic	
VIII.	Future Needs	29

I. Summary of Evaluation

The primary recommendation is to discontinue the designation of the Rio Puerco as a "special" project and continue the same 1260 funds to both the Albuquerque and Socorro Districts. This will give each district the flexibility in the future to use 1260 funds for proper resource management on the most critical watersheds regardless of their location within the District.

The best general solution for improvement of poor watershed condition in both districts appears to be properly designed grazing systems. Therefore, AMP's should be given the highest priority among watershed management tools. Additional manpower must be made available to plan and supervise the AMP's. In order to achieve program balance, it is also recommended that an increase be made in manpower in wildlife management, environmental analysis, lands and archaeological inventory.

II. Findings & Recommendations

A. Major

1. Project implementation.

   a. Finding: The Rio Puerco Project changed management techniques in both the Socorro and Albuquerque Districts in 1968 and 1969. Emphasis was shifted from watershed stabilization practices (i.e., retention and detention dams, small erosion control structures, etc.) to management facilitating projects (i.e., fences, water developments) to implement allotment management plans. This has been a desirable shift and has been a relatively economical means of achieving greater watershed stabilization. Properly designed grazing systems have been effective in solving erosion and sedimentation problems. However, they have not been the total solution to the watershed problem. This is particularly true with respect to headcutting, gully erosion, and water quality.

   b. Recommendation: Continue the procedure of making AMP's the first priority in solution of watershed problems. Land treatment and structures should be applied only where it is shown that proper management alone cannot solve the problems within a reasonable period of time.

2. Project Boundary - Priorities.

   a. Finding: Phase I WC&D System has been completed on all eight of the watersheds in the Albuquerque portion of the

Rio Puerco Project area. Of the 40 watersheds in the Albuquerque District outside the project area, 27 have Phase I completed. Of the total completed in the district, six of the ten highest rated watersheds are in the project area. Of the four outside the Rio Puerco Project area, two are ranked numbers 3 and 4.

The Albuquerque portion of the Rio Puerco has 92 allotments of which 25 have an AMP. It is estimated that at the same level of 1260 Rio Puerco funding, it will take about seven years to implement AMP's on the Albuquerque portion of the project area.

Phase I WC&D in the Socorro portion of the Rio Puerco has been completed for seven of the eight watersheds. There are 32 watersheds outside the Rio Puerco in this district. Phase I has been completed on 10 of these watersheds. Of all watersheds completed, seven of the ten highest rated are in the project area.

The Socorro portion of the project area has 15 allotments. Eleven have AMP's. It is estimated that at the same level of funding, all the feasible AMP's could be implemented in this portion of the project in the next three to four years.

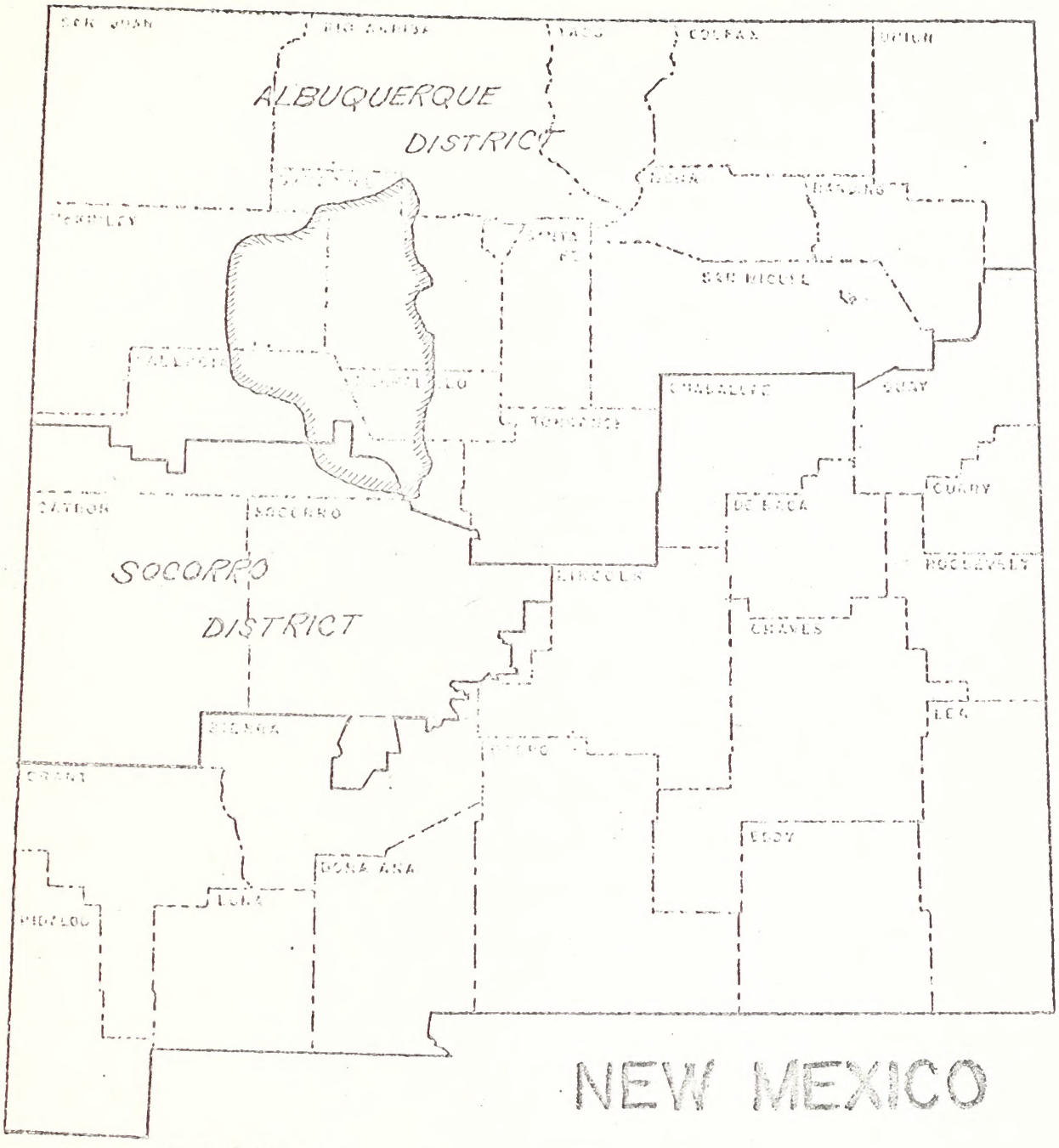
b. Recommendation: Continue the 1260 funding at the same level for both districts, but discontinue designation of the Rio Puerco as a "special" project. This would give the Albuquerque

District the maximum latitude to shift emphasis in the future to the higher priority watersheds outside the project area. Also, since Socorro is nearing completion of AMP's inside the project area, this would give them the latitude to invest these 1260 funds in AMP's outside the project area.

If for some reason it is not possible to discontinue the "special" project designation, it is recommended that the Rio Puerco special boundary (Figure 1) be expanded to include at least all of the San Juan Resource Area in the Albuquerque District and all of the San Augustine Resource Area in the Socorro District (Figure 2). Inclusion of the San Juan Resource Area would include some of the other most critical watersheds in the Albuquerque District. Including the San Augustine Resource Area would allow continued development of AMP's as the first priority in solution of watershed problems.

3. Manpower Limitations.

a. Finding: In the Rio Puerco Resource Area, there are 25 AMP's all of which are in the project area. The Rio Puerco Resource Area receives 11.6 man months in activity 1220 for AMP's. Of this, 8.8 MM are used for AMP maintenance (supervision, evaluation, revision). This is approximately .35 MM or seven days per plan. Considering travel time from Albuquerque, seasonal distribution of workload, the size of operations,



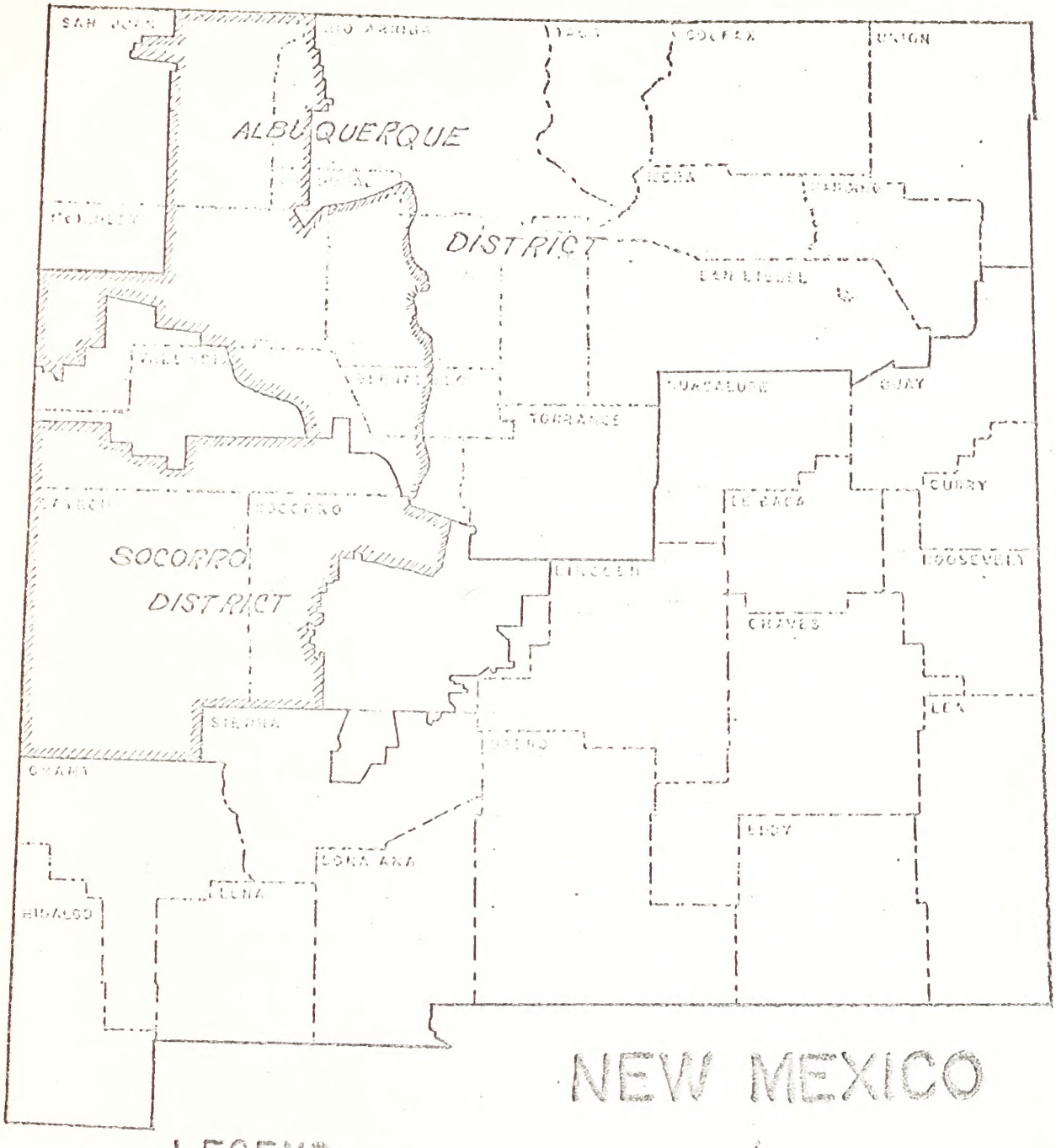
LEGEND

——— DISTRICT BOUNDARY

PROJECT BOUNDARY

RIO PUERCO SPECIAL PROJECT

FIGURE 1



LEGEND

——— DISTRICT BOUNDARY

PROPOSED PROJECT BOUNDARY

RIO PUERCO SPECIAL PROJECT

FIGURE 2

the difficulty in tracking down the operators, and the educational and cultural background of many of the operators, there is considerable doubt that seven days is adequate to provide the necessary supervision, evaluation, and revision.

In the San Augustine Resource Area in Socorro, there are 26 AMP's, 11 of which are in the Rio Puerco Special Project area. The San Augustine Resource Area received approximately 16.9 MM in activity 1220. Of this, 11.0 MM are used for AMP maintenance. This is .42 MM or approximately eight and one half man days per plan. It is estimated that at least 10 days are needed to properly supervise, study, evaluate, and revise an AMP in New Mexico.

At the present, the MM in AMP planning in both resource areas is barely sufficient to keep ahead of the 1260 Rio Puerco funding.

b. Recommendation: Additional positions and MM should be made available in 1220 to provide adequate maintenance of existing and future AMP's. If this is not possible, then additional MM should be made available in 1260 for developing AMP's. Present 1220 MM used in planning could then be shifted to supervision. If permanent positions cannot be allowed, temporary positions should be made available for AMP supervision.

If none of these recommendations are possible, investigate the possibility of shifting 1220 MM into supervision and doing less studies. In any event, the possibility of doing supervision in a more efficient manner such as by airplane should be investigated.

4. Program Balance.

a. Findings: There are strong indications that the Rio Puerco 1260 special funds have created some program imbalance. Manpower in the wildlife activity has not been sufficient to provide adequate input and field review of all AMP's and projects generated by the "special" project.

More manpower to accelerate the land exchange program along with the 1260 program could have increased the efficiency and effectiveness of the project.

Environmental considerations and new demands for environmental analysis of "project" work has increased the workload in this area.

b. Recommendation: Additional wildlife manpower should be made available on a priority basis to provide greater input and review of AMP's. Consideration should be given to shifting present wildlife manpower from HMP's to more coordination with AMP's and watershed projects.

Priority should be given to completing MFP's before 1260 funds are diverted into these new areas.

If funds and manpower are received from package submissions on environmental analysis, archaeological inventory and land exchanges, priority should be given to using these resources to bring these programs into balance where the special 1260 funds are to be invested.

B. Minor

1. a. Finding: The San Luis study has a wealth of long-term information and could be presented on the ground in a practical and easily understandable manner. The relationship to the existing problems on Bureau administered land is excellent.

b. Recommendation: Continue the San Luis study with minor updating and redirection. Form a team of WO, DSC, and NMSO specialists to prepare a proposal reflecting current research needs for southwestern ranges.

2. a. Finding: Visual observation and research results indicate that ripping and contour furrowing are effective in holding soil and moisture on-site for a relatively short time - 3 to 5 years - largely because of the nature of the soil and storm frequency and intensity.

b. Recommendation: Vast areas of contour ripping and furrowing should be avoided except when necessary as a watershed management tool. Use contour ripping only where it shows to be the least cost alternative in meeting watershed objectives.

Any practice that would decrease ground cover for more than 2 or 3 years should be carefully considered prior to initiation.

3. a. Finding: Exclosures have served to show the benefits which can be derived from protective land management.

   b. Recommendation: Continue program of exclosure construction where needed for demonstration and study purposes.

4. a. Finding: There is some evidence of off-road vehicle use. This problem is expected to increase in the future and can have a significant impact on the Rio Puerco watershed, since soils in the project area are highly susceptible to erosion.

   b. Recommendation: Great effort should be made to control off-road vehicle use to keep it to a minimum.

5. a. Finding: Wildlife studies throughout the Rio Puerco project are insufficient.

   b. Recommendation: Develop trend routes to conduct coo counts of mourning doves and crow counts of quail throughout the project areas. This would be one means of documenting the effect of grazing systems on game birds.

   After extensive analysis, establish spring-fall utilization transects on key browse species and on key winter ranges. There is also an apparent need for production studies on

browse species to determine the kind of growth and condition of browse. Yearly fluctuations in browse production should be developed in conjunction with utilization studies. Studies such as those on the Ignacio Chavez Grant should serve as an example.

Where applicable, particularly where big game ranges are involved, revegetation projects should have wildlife utilization and use studies at least two years prior to development. Studies should be continued for a minimum of five years after the project to evaluate the impact on wildlife.

6. a. Finding: AMP's are not adequately considering wildlife needs in critical areas. Competition between deer and livestock is anticipated on these areas.

   b. Recommendation: Complete wildlife intensive inventories with management recommendation for use in the Bureau planning system. The wildlife biologist should review all AMP's and projects.

7. a. Finding: Antelope transplants to date appear to be successful. A significant portion of the area is suitable antelope habitat.

   b. Recommendation: Encourage additional antelope releases to the New Mexico Game and Fish Department on areas of

suitable habitat, particularly where water developments have been completed. On antelope ranges, continue installation of panels and antelope guards through fences.

8. a. Finding: Establishing vegetation on detention dams and borrow areas is needed because of the erosion hazard and disturbance of natural beauty.

   b. Recommendation: Utilize the latest techniques for revegetation on earthen structures and borrow areas. The least cost alternative for meeting objectives (including aesthetic considerations) should be used.

9. a. Finding: Considerable erosion from improper maintenance of county roads was noted. However, some successful efforts of cooperative planning with counties was also found.

   b. Recommendation: Cooperation with county road departments should be continued. In areas where this problem is more serious, extra effort may be required. If proper spreading areas are not available below road drainage ditches, then large storage type ditches should be considered.

10. a. Finding: Management facilitating projects, land treatments and structural practices can seriously disturb the aesthetic values of an area if improperly designed or placed in conspicuous locations. Many of the Rio Puerco projects, particularly recent chainings, were designed with aesthetic

values in mind. However, conscious effort must be continued if the aesthetic quality of the environment is to be maintained.

b. Recommendations:

Fences - In flat or rolling open country, use steel gray fence posts that blend with the surrounding background. Avoid skylining wherever possible.

Pipelines - Keep the width of the rights-of-way for pipelines to a minimum. When laid through brushy areas, remove only the brush which would interfere with installation of the pipeline. When laying pipeline through timbered areas, remove only those trees which cannot be avoided and curve pipeline in and out to avoid straight line timber breaks. Reseed right-of-way with native vegetation.

Storage tanks and drinking troughs - Continue to paint storage tanks and drinking troughs to blend with background vegetation. Locate such improvements on inconspicuous sites away from roads, preferably in timbered or brushy areas. Hiding developments of this nature will result in less maintenance because of reduced vandalism.

Land treatments - Design all land treatment projects to blend with the natural environment. Avoid straight lines on edges.

III. Nature of Evaluation and Assumptions

The evaluation of the Rio Puerco Special Project was organized by the New Mexico State Office to:

a. Evaluate the progress to date in accomplishing the original and any revised Rio Puerco Project objectives.

b. Evaluate the need for further conservation and development of lands within the project area in relation to lands outside the project area within the Albuquerque and Socorro Districts.

c. Base on "a" and "b" above and in light of current range, watershed and wildlife management concepts, recommend a future direction and schedule for the Rio Puerco Project.

The team consisted of the following members:

Chairman - Donald D. Waite, Planning Coordination Staff, NMSO

John S. Davis, Resource Coordination Staff, WO

Floyd E. Kinsinger, Range Staff Leader, DSC

Carl M. Rice, Watershed Staff, PSC

William F. Leifeste, Division of Resources, NMSO

Lanny O. Wilson, Division of Resources, NMSO

Daniel C. B. Rathbun, Planning Coordination Staff, NMSO

This evaluation is neither functional nor general, but falls in the category of a Special Evaluation provided for by Bureau Manual 1242.3.

The team recognizes that all resource activities have workloads and outputs within the geographic boundary of the Rio Puerco Special Project. However, all of the special funds for this project are provided in activity 1260 and the most significant benefits have been in watershed, livestock forage, and wildlife. Therefore, only these areas were evaluated in depth.

The first meeting was held during the week of November 29 to December 3, 1971. The team interviewed both District Managers, Albuquerque and Socorro, appropriate area managers and staff personnel. A field trip to portions of the watershed in both districts was conducted.

The second meeting was held in Santa Fe, New Mexico February 22-25, 1972. At this meeting a rough draft of this report was prepared. Further refinement and preparation of the final report was handled through correspondence and telephone discussion.

This report of the evaluation is based on the individual observations of team members, data provided by district personnel, and subsequent discussion.

Frequent reference to the results of the San Luis study is made. Many of the conclusions in this report are based on the findings of the San Luis study. In many facets of watershed and range management, this study is the only quantified source of data.

IV. Origin and History of the Project and Background

The Rio Puerco Special Project began in the fall of 1962 at which time the project was allocated $525,000 to be spent on S&M projects by the end of the fiscal year. Figure 1 shows the general area of the Rio Puerco watershed.

In the first 5 years of the project, emphasis was placed almost entirely on watershed stabilization practices (i.e., retention and detention dams, small erosion control structures, and land treatment). In the process of developing these improvements, a number of wells were drilled to supply construction water; protection fences for land treatment projects were constructed; and earthen structures which provided the dual purpose of watershed control and supply of livestock were also constructed.

In 1968, the emphasis began to shift to grazing management through Allotment Management Plans. The first AMP was completed in Albuquerque in June 1968. By fiscal year 1971, the change in emphasis had been completed and most of that year's project money went directly to improvements necessary to implement AMP's.

Elevation and Climate

The elevation of the project area is between 6,000-10,000 feet. The climate is semi-arid; the annual precipitation averages approximately 10 inches. Sixty percent of this precipitation occurs between June and September -- usually in one to five localized "cloudbursts". The growing season is approximately 150 days.

Massive Soil Erosion

The Rio Puerco watershed is afflicted with one of the most spectacular soil erosion conditions in the United States. The watershed is one of the major tributaries of the Rio Grande, embracing approximately a third of the drainage that lies in New Mexico above the Elephant Butte Reservoir which supplies irrigation water to the Elephant Butte Irrigation District. The Rio Puerco drainage supplies one-sixteenth of the waters of the Rio Grande, yet it is the source of over half (56%) of the sediment that obstructs the main Rio Grande channel. Many earth canyons of the Rio Puerco have occurred during the past 100 years. Drainages frequently are trenched to the divide and much of the range land has eroded away. More than 500,000 acre feet of soil have been scooped out of the valley fills, and scalped from the topsoils of surrounding uplands to create havoc locally and downstream.

Land Use

Project area lands have a long history of agricultural use. Indians irrigated the benches of the Rio Puerco drainage for almost 900 years.

In 1890 extensive irrigation farming was carried on in the valley. This has practically been abandoned. Six villages have ceased to exist. The valley swales, once farmed and grazed, are now gone.

Less than five percent of the project area is currently devoted to the production of irrigated crops. Most of the lands are now used for the grazing of livestock.

V. Original Project Objectives

The objectives of the Rio Puerco Project as originally stated:

A. To arrest accelerated erosion currently resulting in spectacular losses of soil.

B. To stop gully erosion for the protection of remaining valleys in the area.

C. To restore the production of forage for livestock and wildlife.

D. To confine the movement of sediment to the upper watershed to prevent further downstream losses.

E. To provide access and facilities necessary to enable full use of timber, recreation, and other resources of the area.

The project was originally intended to include the development of all the surface resources of the area. Range improvement projects were to serve both livestock and wildlife whenever possible. Mineral examinations, land tenure adjustments, and cadastral surveys were to progress on a priority system, and to an intensity that would have been required by the development program. Funding was only received from 1260, and only benefits attributable to these and associated funds were considered.

VI. Accomplishments to Date

	Practice	Units	Units Accomplished
1.	Brush Control	Acres	166,844
2.	Fencing	Miles	336.1
3.	Seeding	Acres	34,300
4.	Water Developments	Number	151
5.	Other Water Control Practices (Structures)	Number	52
6.	Soil Stabilization	Acres	8,600
7.	Wildlife Protection (modified fence)	Miles	13.5
8.	Wildlife Food and Habitat	Acres	736
9.	Road Construction	Miles	40
10.	Livestock Trails	Miles	7.5
11.	Road Maintenance	Miles	5.6
12.	RI Waters	Number	5
13.	RI Fence	Miles	2.8
14.	URA	Number	6 of 6
15.	MFP	Number	0 of 6*
16.	WC&D Phase I	Number	15 of 16
17.	WC&D Phase II	Number	1 of 16
18.	AMP's	Number	36 of 107

* 3 MFP's completed through Step II, awaiting public participation for finalization of Step II.

VII. Evaluation of Benefits and Effectiveness

A. Vegetation and Soils

1. Management. Of the 36 AMP's currently operational, trend photos and plot data, with few exceptions, show various amounts of increases in vegetation vigor, production and litter.

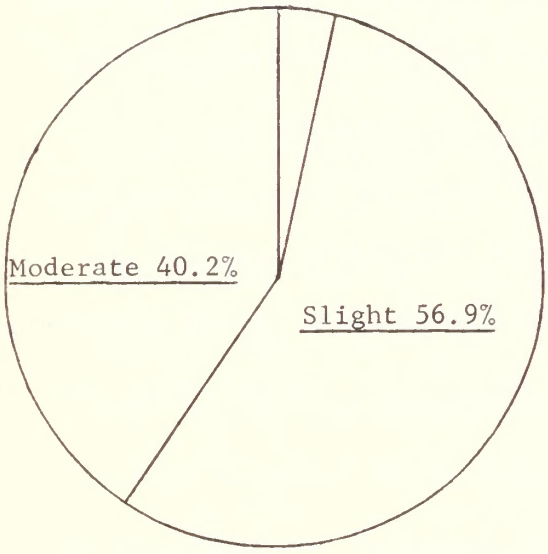
The Mumford Allotment in PU 02-06 data illustrates a definite trend towards an increase of ground cover from 4/30/68 to 5/31/71. Canopy cover of a shrub increased from 11% in 1968 to 76% in 1971 and a single grass plant varied as follows:

	Basal	Canopy	Total
1968	2%	1%	3%
1969	6%	4%	10%
1970	4%	6%	10%
1971	5%	8%	13%

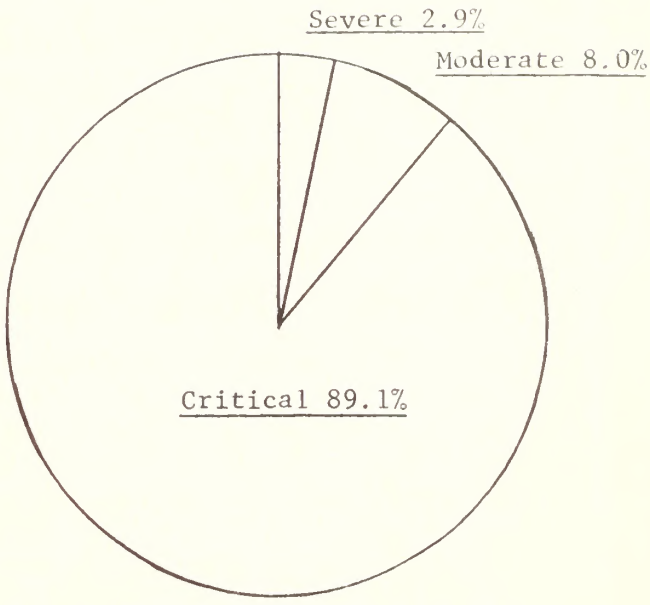
(The above data was calculated from trend photographs.)

In most instances, Allotment Management Plans are the most feasible way of reducing the soil surface factor (SSF) from its present value to the lowest possible rating that can be expected for the area. Allowing a ten-year period to realize the ultimate change, the following figure shows the improvement that should be realized for AMP's in the Rio Puerco Project area. Also shown is an estimate of the anticipated situation without AMP's.

Conservation objective - changing erosion condition class by execution of AMP and comparison of predicted condition without the plan.



Future with Plan
10 years hence



Future without Plan
10 years hence

The benefits of the AMP program have mostly accrued to the natural resources as no increases in AUM's have been given the allottee except to restore voluntary reductions taken when the AMP was initiated.

All the increased vegetative response has primarily served to provide protective soil cover on the watershed.

The San Luis Research Study data provides indications of the value of intensive livestock management as a watershed management tool. This data showed a loss of ground cover between 1952 and 1958 with yearlong

grazing. It can be assumed from this that if yearlong grazing is continued, a reduction in desirable ground cover and an increase in soil loss can be expected. However, this was the span of time covering the most severe drought in the history of weather records in this area.

Proper livestock management or removal of livestock from the watershed lands has increased ground cover and, in turn, aids in the prevention of soil erosion. Excellent examples are to be found in many of the flood plains. One flood plain (Photo PSC-2849) was observed that had a minimum of 8" of overland flow, but very little soil loss because of the excellent ground cover. Increased ground cover in the vegetation filter fields and water channels starts aggradation and decreases the total sediment production.

San Luis Watershed Studies and exclosures scattered throughout the project area indicate that significant productive potential exists. It is conservatively estimated, based on measurements of ground cover, herbage yields, and runoff and sedimentation, that total vegetative cover (plans and litter) and herbage yields can be increased by 50% and in many cases by 100% (doubled). Winter grazing only on the San Luis Watershed Studies increased litter 3-fold (from 7 to 24%) and decreased bare ground by about one-sixth.

Resultant vegetation and litter increases from properly designed grazing systems will reduce runoff by an estimated 33%, decrease the velocity by 50%, resulting in decreased sediment movement to only one-fourth of that without proper management.

Seasonal grazing (summer deferment), although providing some improvement in vegetation vigor and protective cover, does not appear to maximize ground cover. (See San Luis Research Study results.)

Properly designed grazing systems incorporating principles of rest, seed trampling, rotation, etc., can provide more progress toward realizing the productive potential of the area.

Average cost for implementing the current 36 AMP's is calculated at $22,650 or $1.74 per acre or $13.44 per AUM; but this includes some erosion control and land treatment costs which were not really essential to implementation of the AMP. A more realistic cost for implementation of AMP's is approximately $1.37 per acre. This includes only land treatment necessary to avoid reductions and excludes planning costs (man months).

2. Ripping. Ripping referred to in this report is the practice of pulling a metal tooth and furrow opener which results in loosening the soil approximately 18 inches on either side of the tooth or opener. A trench or furrow on the soil surface also results.

More than 30,000 acres of ripping has been completed within the Rio Puerco area. Studies designed to evaluate ripping as a watershed management tool have shown that soil movement reverted back to the same level or increased three to five years following the practice where ground cover did not increase.

Ripping on the San Luis and Ojo del Espiritu Santo plots resulted in a 23% and 28% loss in vegetation following the treatment. After the first growing season, no loss in vegetation could be detected on the Ojo plots. The plots had summer deferred grazing and the ground cover increased on both the control and treated plots. Ripping appeared to have no effect on ground cover. However, ripping was effective in preventing runoff and soil movement.

A three year study on the San Luis area indicated alkali sacaton (Sporobolus airoides): out produced galleta grass (Hilaria jamesii), following ripping. The reverse was true prior to the ripping.

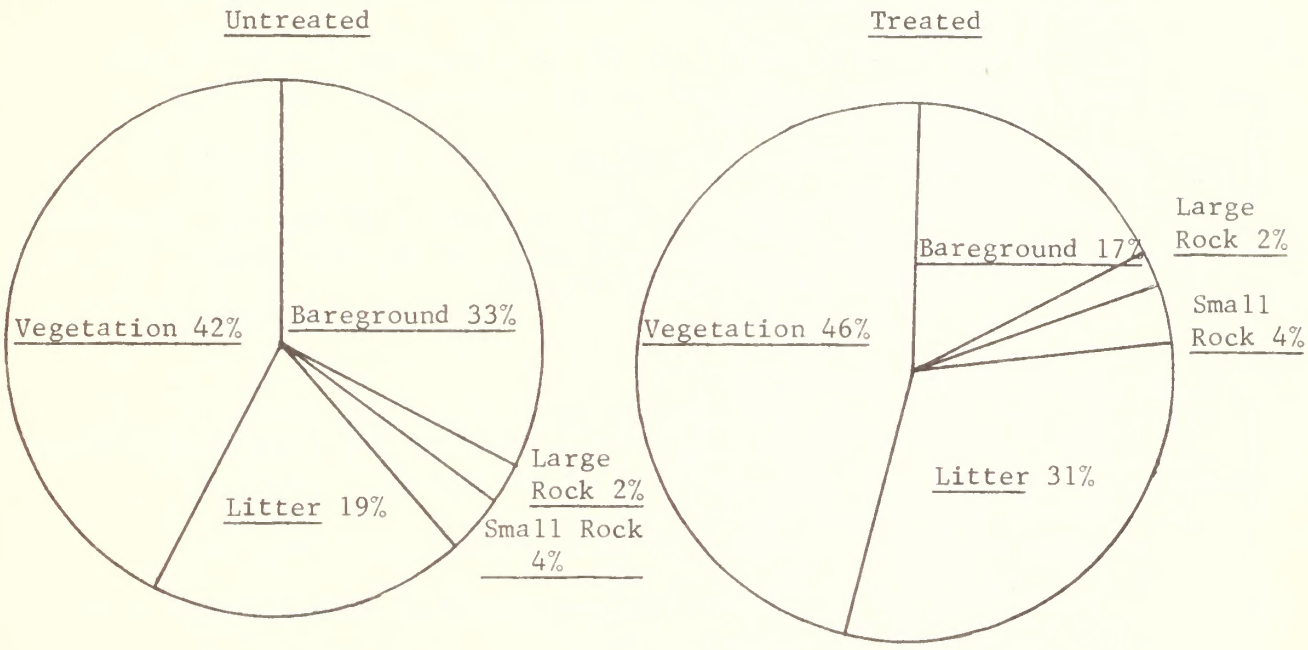
Ripping treatments cost an average of $3.50 per acre.

3. Brush control. Benefits in both vegetation and soils result from brush control. On the Cluff Allotment an increase in forage density of 66% was obtained from the combination of grazing management and brush control projects. An expected reduction in soil surface factor of 30 points can be expected from most brush control projects.

Costs of chaining pinon-juniper has averaged approximately $6.00/Ac. while chaining of sagebrush has been approximately $3.00/Ac. Marden brush cutting and rotary brush cutting cost approximately $4.50/Ac. Aerially applied chemical control cost approximately $2.60/Ac.

Results of studies on big sagebrush control show some of the benefits to the watershed conditions. Data to illustrate this is shown in the following figure from a typical double chaining project in the project area.

Comparison of Soil Cover between Treated and Untreated Areas



Soil Surface Factor - 66

Soil Surface Factor-40

4. Structures. (On-site benefits). The small erosion control retention and detention structures have and will continue to be effective in stopping migration of headcuts. They have avoided what could have been the total loss of many hundreds of acres of productive valley bottoms. In some areas, the structures have caused aggradation. This has aided in restoring the productivity of the valley floors by reestablishing the original level of the flood plains or stabilizing channel bottoms. Also, some structures have created almost subirrigated conditions in areas immediately above and below the structures. Structures installed to date have trapped an estimated 2,420 ac. ft. of sediment. This is based on average entrapment of 10 ac. ft. per structure.

San Luis research results show that a combination of seasonal livestock management and structures has reduced sedimentation from two watersheds from .85 acre foot/year to an .15 acre foot/year in 4 years.

Costs of detention structures average $1.00/cu. yd. Size has range from 5,000 to 80,000 cu. yds.

B. Wildlife and Recreation

Land use practices have had both a positive and negative effect on the wildlife populations.

Development of detention structures to check erosion is of benefit to wildlife populations. For example, gully erosion has reached a point in one area of the Rio Puerco that resulted in a barrier to a migrating deer herd. Antelope cannot cross deep sheer-sided gullies resulting in a restriction in range, thus lower populations.

Other wildlife benefits which will result in increased recreation benefits noted in the Rio Puerco area are:

1. Pinon-juniper chainings designed for, and developed to enlarge a deer/elk winter range. Winter range was the limiting factor to both big game species.

2. Pinon-juniper chainings designed to increase the edge effect for deer on yearlong ranges. Leave areas for edge effect and cover were not adequate in most brush control projects.

Additional quail, mourning dove, and song bird habitat will result should this practice be initiated.

3. Antelope releases made by the New Mexico Department of Game and Fish where habitat has improved to reestablish new herds.

4. Fences designed to allow free movement of big game, particularly antelope.

5. Intensive grazing systems for key wildlife areas, and specific wildlife objectives in AMP's, where wildlife intensive inventories and habitat management plans were developed with or prior to allotment management plans.

6. Increases in quail and mourning dove populations because of better nesting, habitat, and additional food resulting from the implementation of livestock grazing systems.

7. Water in livestock troughs for wildlife in pastures not having livestock. This practice is of particular importance for song birds and antelope.

8. Ramps in livestock troughs to allow birds and small mammals a platform to obtain water. These ramps also serve in keeping animals from drowning. Not all livestock troughs had ramps.

9. Fenced exclosures of approximately 20 acres in size on flood plains above detention structures which resulted in maximum nesting and winter cover for quail.

10. Two permanent ponds with fishable populations of large mouth bass, and excellent waterfowl nesting and brood rearing habitat.

C. Environment

Benefits to range, watershed and wildlife can be considered as generally beneficial to the environment. This section deals primarily with aesthetics and matters not covered in other sections.

Early projects, particularly land treatments, did not receive adequate consideration of the impact on aesthetics. Some chained and ripped areas were laid out with straight line boundaries with no leave areas. Recent projects have greatly improved in this respect. The pinon-juniper chaining in the Martinez Brothers allotment is a good example. The leave areas were placed to camouflage the unsightliness of the project.

Other examples of recent improvement in project design to enhance aesthetic values are found in fence and pipeline layout and placing water storage tanks underground.

D. Flood, Sediment and Water Quantity & Quality (off-site)

1. Structures. The existing structure (retention and detention) have trapped an estimated 2,240 acre feet of sediment since 1953. It is estimated that gully erosion contributes approximately 10% of the total erosion problem, but contributed approximately 75% of the sediment. Gauging stations on the upper watershed indicated that less than 1% of the precipitation occurs as stream runoff.

Of the 15,000 acre feet of sediment deposited annually in the Elephant Butte Dam, 56% (8,400 acre feet) comes from the Rio Puerco drainage. Downstream damages amount to $1,646,300 (1956 est. from BR,CE). The Rio Puerco on a straight percent ratio contributes $444,500 of this damage annually. The Bureau lands comprise 27% of the Rio Puerco watershed.

Data from the San Luis Research Study and others indicate a reduction in sedimentation, a reduction in channel water yield, and an increase in underground water yield. Presumably, this is occurring on similar Rio Puerco lands receiving similar treatment. This alone is a benefit to water quality and quantity.

It is difficult to estimate the effect that the Rio Puerco Special Project has had on reducing off-site damage. However, the project probably has not had any significant effect to date on the sedimentation that is reaching the Elephant Butte Dam. The 2,240 acre feet of sediment trapped in the watershed to date may have some effect on reducing sediment damage to Elephant Butte Dam in the future.

E. Social and Economic

The Rio Puerco special funds have had a direct economic impact on the counties of Socorro, Valencia, Sandoval and McKinley. These counties have an average per capita income significantly below the national average and unemployment is above the national average.

County	1970 Population	1966 % Families Under Poverty Level	1967 Per Capita Personal Income	1970 % Unemployment
McKinley	43,208	37.3	$ 1,559	6.4
Sandoval	17,492	58.2	991	12.2
Socorro	9,763	40.5	1,605	9.5
Valencia	40,539	24.6	1,816	6.4
	National Average		3,159	4.9

Cuba, a small town (1970 population - 2,847) in Sandoval County, received considerable direct economic benefits from the project. The annual dollar impact, not considering the multiplier effect was:

1. Per diem expenditures by district employees	-	$ 24,000/year
2. Gasoline and vehicle services	-	13,000/year
3. Salary of local labor	-	11,000/year
4. Rent of office and yard space	-	1,400/year
5. SWCD contract payments	-	54,100/year
Total		$ 103,500/year

Although no new AUM's were added by the project, it has helped stabilize the livestock industry by avoiding the loss of AUM's. The benefits have probably been significant because of the high dependency of the industry on BLM forage in both the Albuquerque and Socorro Districts. It is estimated that in the Albuquerque District, 87% of Section 3 licenses derive more than 50% of their

forage from public domain lands; and that 41% are dependent upon BLM lands for over 90% of their forage requirements. In the Socorro District, 81% of the ranches obtain more than 26% of their livestock feed from BLM.

VIII. Future Needs

A. Range

In evaluation of the opportunities outside the Rio Puerco Special Project area, only grazing administration and range condition in Type I "best blocked" planning units was considered.

In the two districts there are 375 allotments; 2,797,000 Federal acres and 4,032,000 total acres outside of the project area in Type I planning units. Of this, 12% of the allotments, 26% of the Federal acreage and 25% of the total acreage are under an AMP in the Albuquerque District. In the Socorro District, 22% of these allotments, 26% of the Federal acreage, and 22% of the total acreage is under AMP. Of this, only 37% of the AMP's in Albuquerque and 82% in Socorro have been implemented and are being grazed according to the designed system. The remaining percentages are awaiting completion of management facilitating projects.

Inside the project there are 107 allotments, 585,150 Federal acres, and 834,921 total acres suitable for AMP. Of this, 34% of the allotments, 54% of the Federal acres, and 56% of total acres are under AMP inside the project area in both districts.

Table VIII-1 contrasts the percentage completion and implementation of AMP's inside and outside the project area in both districts.

In the Albuquerque District, there is some over-obligation outside of the project area. It is generally felt that the capacities are set about right if an AMP and some land treatment work could be done. Some reductions were made in the San Juan Resource Area. Most of these reductions have now been restored. However, the need for reductions is anticipated again if AMP's are not implemented.

In the Socorro District, outside the Rio Puerco Project area, the most current range survey is somewhat higher than the actual capacity, thus the strong potential for over-obligation exists. Many individuals are paying for their full qualifications and running about 75%. There have been no reductions in recent years.

B. Watershed

As with range, only the Type I areas were considered in contrasting need inside and outside the project area.

Of the estimated 72 watersheds outside of the project area, 51% have had Phase I of the WC&D system completed. Only one Phase II has been completed to date. Until Phase I has been completed on all watersheds, no quantifiable statement of needs can be made. However, 7 of the 10 highest rated watersheds in the Socorro District are in the project area and 6 of the 10 highest rated watersheds in the Albuquerque District are in the project area. This is based on available WC&D data.

Table VIII-2 gives a more complete breakdown of the watershed situation.

The following is an analysis of the AMP situation on the 10 highest rated watersheds in the Albuquerque District. Percent of AMP coverage is based on estimates.

Ranking	Watershed	Location	% Coverage by AMP	Federal Acreage	Total Acreage
1	San Ysidro	Inside	90%	49,225	60,745
2	Rio Puerco	Inside	50%	60,521	87,026
3	Gobernador	Outside	10%	42,774	68,674
4	Cereza	Outside	10%	79,919	107,279
5	Francis Creek	Outside	75%	25,954	46,874
6	Piedra Lumbre	Inside	30%	17,450	26,650
7	La Jara	Outside	75%	32,741	39,636
8	Torreon	Inside	0	112,216	134,236
9	Encino	Inside	100%	27,942	31,462
10	Chico	Inside	10%	22,620	31,000

Because 84% of the Federal acres and 80% of the total acres in the Rio Puerco Special Project area in Socorro are covered by AMP's and because only 43% of the watersheds have Phase I completed, no similar analysis was made for watersheds in the Socorro District.

C. Wildlife

There is a total of 4,032,200 acres outside of the project area in Type I planning units in both districts. Approximately 20%

of this has intensive inventory and analysis. Nearly 17% of this is under habitat management plan. Inside the Rio Puerco Project area in best blocked planning units in both districts, there is a total of 834,900 acres. Of this, approximately 19% is covered by intensive inventory and analysis, and 7% is under HMP. Table VIII-3 shows a more detailed breakdown by District.

The intensive inventory and analysis in the Albuquerque District is primarily for big game animals and does not consider small game and non-game animals. A recent increase in interest in these non-big game species may cause revision of the existing inventory and analysis.

Discussion with the wildlife biologists in both districts indicates that they can generally review all AMP's and can review most projects in the office. However, they do not believe they can give projects adequate field review. That portion of the AMP's and project that they are able to cover is generally accomplished at the cost of other work.

TABLE VIII-1

	No. of Allotments	No. of Operators	Acres (Type I) Federal	Acres (Type I) Total	No. AMP's	% of Allotment	AMP Acres Federal	AMP Acres Total	AMP Acres % Federal	AMP Acres % Total	% Implemented
Albuquerque District (less Rio Puerco)	240	495	1,527,000	2,125,000	28	12%	395,197	524,704	26%	25%	37%
Albuquerque-Rio Puerco	92	182	401,643	494,643	25	27%	162,228	194,970	40%	39%	79%
Socorro District	135	145	1,269,240	1,907,222	30	22%	324,343	413,249	26%	22%	82%
Socorro-Rio Puerco	15	16	183,760	340,278	11	73%	154,099	273,153	84%	80%	64%

TABLE VIII-2

	No. of Watersheds	Phase I Done	% Completion	Phase II Done	% Completion	No. in 10 Most Critical
Albuquerque District (less Rio Puerco)	40	27	68%			4
Albuquerque-Rio Puerco	8	8	100%	1	13%	6
Socorro District (less Rio Puerco)	32	10	31%			3
Socorro-Rio Puerco	8	7	88%			7

TABLE VIII-3

	Total Acres (Type I)	Acres with Intensive Inventory and Analysis	% Completion	Total HMP Acres
Albuquerque District (less Rio Puerco)	2,125,000	250,000	12%	250,000
Albuquerque-Rio Puerco	494,600	130,000	26%	30,000
Socorro District (less Rio Puerco)	1,907,200	548,300	29%	421,000
Socorro-Rio Puerco	340,300	27,900	8%	27,900

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GSA FPMR (41 CFR) 101-11.6

UNITED STATES GOVERNMENT

Memorandum

7250.2

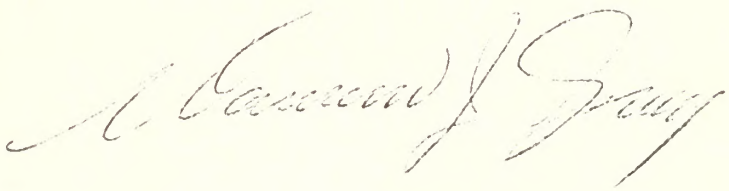
TO : State Director (911) DATE: June 16, 1972

FROM : District Manager, NM-1

SUBJECT: Rio Puerco Evaluation Report

The above report contains very little to which we can take exception. It is a complete and accurate appraisal of the current status of the project.

We do not agree entirely with the recommendation to discontinue the Rio Puerco as a special project. Although there is much to be said for the flexibility this would permit, we feel there is also a great deal to be said for completion of the project in its present form. If the project can be completed, we will have roughly a half million acres (in all ownerships) under grazing systems in one virtually solid block. This should provide an excellent showplace to demonstrate the value of this type of management. Distribution of funds to other areas will prolong the time necessary to complete the management facilities on this area.



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MAY 1962 EDITION
GSA GEN. REG. NO. 27

5010-107

UNITED STATES GOVERNMENT

Memorandum

TO : CHIEF, PLANNING COORDINATION STAFF, NMSO

DATE: JUNE 13, 1972

IN REPLY REFER TO:

1240

FROM : DISTRICT MANAGER, SOCORRO

SUBJECT: RIO PUERCO EVALUATION REPORT

WE HAVE REVIEWED THE ABOVE EVALUATION REPORT PER YOUR SNT OF JUNE 5, 1972. WE HAVE NO COMMENTS TO SUBMIT.

Robert P. Kennedy

Buy U.S. Savings Bonds Regularly on the Payroll Savings Plan

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